

November 16, 2018

Project No. 013-6052-014

Debra Rossi, Remedial Project Manager

USEPA Region 3
1650 Arch Street, 3HS21
Philadelphia, PA 19103-2029

**RE: SUMMARY OF COMMENTS AND RESPONSES ON
PRE-DESIGN INVESTIGATION AND REMEDIAL DESIGN WORK PLANS
DELAWARE SAND & GRAVEL SUPERFUND SITE
NEW CASTLE COUNTY, DELAWARE**

Dear Ms. Rossi:

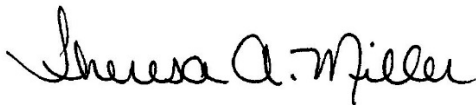
As requested by the Delaware Sand & Gravel Remedial Trust (Trust), Golder Associates Inc. (Golder) prepared responses to comments provided by the United States Environmental Protection Agency (USEPA) and the State of Delaware Department of Natural Resources and Environmental Control (DNREC) on the Pre-Design Investigation Work Plan (PDI WP, dated August 17, 2018) and the Remedial Design Work Plan (RDWP, dated September 17, 2018) for the DS&G Superfund Site (Site) located in New Castle County, Delaware. The USEPA provided comments on the PDI WP and RDWP via email on October 24, 2018 and included comments from DNREC dated October 22, 2018.

The USEPA and DNREC comments with the Trust's responses are summarized on the attached table. As discussed during our meeting on October 31, 2018, the field work associated with the PDI WP will commence on November 26, 2018. The revised PDI WP with revised Sampling and Analysis Plan are anticipated to be submitted on or before December 31, 2018, and the revised RDWP is anticipated to be submitted on or before January 31, 2019.

If there are any questions regarding this document, please do not hesitate to contact the undersigned.

Very truly yours,

Golder Associates Inc.



Theresa A. Miller, LSP, PG
Senior Consultant

cc: (via email) C. Wirtz, DNREC
D. Sutton, HGL
S. Mays, DS&G Trust

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Summary of USEPA's and DNREC's Comments on the Pre-Design Investigation and Remedial Design Work Plans and the DS&G Trust's Responses
Delaware Sand & Gravel Superfund Site, New Castle County, Delaware

Comment No.	Section No.	Category	Comment Location	Specific Comment	Response/Approach to Comment
DNREC Comments Pre-Design Investigation Work Plan and Sampling and Analysis Plan via letter dated October 22, 2018					
1	NA	PFAS	SAP	<p>For consistency – especially with regards to PFAS sampling – the work plans and SAP should be updated with the groundwater sampling procedures that were discussed at the Army Creek Landfill Site meeting on September 20, 2018, summarized by email dated Oct. 1, 2018. In addition, DNREC would like to have the PFAS results in the EQUIS EDD format, if possible.</p> <p>Please note that DNREC has a new PFAS policy for surface water and groundwater effective July 2018. PFOS and PFOA were added to the state list of hazardous substances following the EPA's adoption of a Health Advisory Level of 70 parts per trillion for each contaminant alone or as a combined concentration. This value is now used as the screening level for determining if further evaluation leading to risk assessment needs to be conducted. The policy is available at: DWHS PFAS Policy.</p>	The PDI WP and SAP will be made consistent with groundwater sampling procedures that were discussed at the Army Creek Landfill Site meeting on September 20, 2018, summarized by email dated October 1, 2018, and the PFAS results will be provided to DNREC in the EQUIS EDD format.
2	NA	DDA	Section 3.5.4.1.1, page 20	The extent of impacted soil and groundwater in the Columbia Aquifer along the northern DDA slurry wall was identified as one of the additional uncertainties considered in the development of the CSM and completion of the FS, as noted in the work plans. It does not appear that this area was fully addressed in the SAP. Additional soil and groundwater sampling may be needed in the Columbia Aquifer outside of the northern DDA slurry wall and partition area.	See USEPA PDI WP Comment 15 below
3	NA	Surface Water / Army Creek	Section 3.5.5, page 22	In the future, it should be determined if Army Creek is a gaining or losing stream, as discussed during the Army Creek Landfill Site meeting on September 20, 2018.	The available hydraulic data for Army Creek and the Columbia Aquifer appears to indicate some areas are losing and others are gaining. As discussed with the USEPA on October 31, 2018, this evaluation can be performed during Phase 4 of the PDI (see Section 6.2 of the PDI WP) and will not be addressed in the current field effort. The description of Phase 4 in Section 6.2 of the PDI WP will be modified to state "Perform additional assessment (assumed to be similar to Phases 1 through 3), if necessary, to evaluate target capture zones, design extraction rates and/or other areas of uncertainty not adequately addressed in Phases 1, 2, or 3."
USEPA Comments on Pre-Design Investigation Work Plan and Sampling and Analysis Plan Received via email dated October 24, 2018					
General Comments					
1	NA	Old Figure references	misc.	Figures from other documents were referenced throughout the document. Please either provide these figures in the document or provide a compilation of these figures as a stand-alone reference if it is anticipated that they will be relevant in forthcoming documents.	A compilation of these figures will be included as an appendix in future documents (not included in the revised PDI WP) where they are relevant.
2	NA	misc.	misc.	There are several instances where the Work Plan refers the reader to the SAP or the SAP refers the reader to the Work Plan. In following these references, there is sometimes insufficient information or direction to instruct the field staff in conducting the proposed activities. In addition, except for the three PFAS SOPs, SOPs are not included. If other SOPs are appropriate (e.g., logging soil, collecting groundwater samples, and cleaning equipment), they should be included with the planning documents.	As discussed with the USEPA on October 31, 2018, Golder's available SOPs will be added to the SAP, and references between the PDI WP and SAP will be tightened up to ensure the appropriate information is available and clear.
3	NA	1,4-dioxane	SAP	This document refers to 1,4-dioxane as both a VOC and SVOC. From an analytical perspective, 1,4-dioxane can be prepared for analysis as a VOC or an SVOC. However, due to its physical properties, 1,4-dioxane cannot be easily purged as a VOC. Region III's Office of Analytical Services and Quality Assurance generally recommends analysis of 1,4-dioxane as an extractable SVOC. Please provide documentation to support the analysis of 1,4-dioxane as a VOC.	As discussed with the USEPA on October 31, 2018, information was previously provided to and approved by USEPA for use of Method 8260 and 8260 SIM for 1,4-dioxane analysis. More specifically, on October 25, 2012, the USEPA stated via email to the DS&G Trust "Based on the laboratory reports you submitted, our QA Branch recommends that you continue to use Method 8260 and 8260 SIM (if 8260 yields non-detect or qualified result) for Site samples" and requested that the lab "provide the demonstration of capability study results performed for dioxane when the instrument was initially set up". The laboratory information was provided to the USEPA via email dated October 27, 2012, and the USEPA responded "[t]he test results are acceptable and, as previously mentioned EPA approves use of 8260 and 8260 SIM for 1,4-dioxane analysis at the Site." via email dated October 31, 2012.
4	NA	TIC evaluation	SAP	The SAP should include a provision for a biennial evaluation of tentatively identified compounds for potential addition to the target analyte list.	Provision for a biennial evaluation of tentatively identified compounds (TICs; as requested in the USEPA's approval of the December 2016 TIC evaluation) will be added to the SAP.
5	NA	RDWP	misc.	Certain specific comments on the PDI Work Plan, below, also apply to the RD Work Plan, whether noted in the comment or not	These similar items will be identified and addressed where needed in the revised documents.
6	NA	footnotes	misc.	There is redundant numbering for some footnotes, e.g., "Existing slurry-wall system;"24[23]" in Section 4.4.	Footnote numbers from quotes will be stricken and only one set of footnote numbers will be included in the revised documents
Specific Comments					
7	Section 1.2.1	Brief Site History and Description	page 3	Please change the title of this section to "Brief Site Description and Disposal History," consistent with the title of Section 2.1 in the RD Work Plan	This change will be made for the revised PDI WP.
8	Section 1.2.2	Aquifer Use	second to last paragraph, page 3	In the second to last paragraph of this section, AWC's aquifer storage and recovery (ASR) system is discussed. However, the discussion here and in the referenced section of SSCR, Rev. 2 is unclear as to whether the ASR well is still used and, if so, the frequency and duration of use. In Section 3.5.5, uncertainty regarding capture zones along the east side of the attainment area is discussed in connection to the shutdown of wells AWC-G3 and AWC-K1 in 2012. The presence and potential use of the ASR system also impact the uncertainty and should be discussed. Also, language should be added identifying the monitoring system components in the downgradient portions of the plumes that will address these uncertainties.	<p>As discussed with the USEPA on October 31, 2018, the following response to this comment was received from AWC via email:</p> <p>"With respect to use of the ASR, it would be our intent to store approximately 130 million gallons in the ASR well between the Fall and the Spring at a relatively stable injection rate and then to withdraw during the summer (as early as late Spring and as late as into the early Fall depending on weather conditions in a given year) at a rate of about 1 mgd, peaking at as much as 1.5 mgd, with this cycle repeating every year indefinitely. As in the past, the need for well rehabilitation could impact the exact timing and amounts stored and the entire amount stored may not need to be recovered in a given year."</p> <p>"... part of the DNREC review process required that Artesian demonstrate that the ASR injection water remain within the capture zone of the Llangollen well field. Several lines of evidence were used to demonstrate containment of the water at the ASR well. System monitoring wells were used to develop flow nets for both injection and recovery phases of the ASR well. In addition, a ground water MODFLOW model was developed to project the distribution of water throughout the aquifer. Finally, fluoride in the drinking water was used as a tracer for the movement of the injected water. The MODFLOW model particle tracking illustrated that water remained in the Llangollen well field. In addition, the distribution of fluoride in all six monitoring wells, G-3 and K-1 confirmed the distribution of water within the Llangollen well field. In particular, there are two monitoring wells used as part of the ASR system east [of] Route 9. The wells monitor the shallow (MW-2) and deep (MW-3) parts of the Upper Potomac Aquifer. These wells monitor the eastern side of the ASR injection water. The water injected into the ASR wells contains fluoride as part of the requirements for drinking water. The fluoride is used as a tracer to monitor the distribution of the injection water in the aquifer. During the shutdown of K-1 and G-3 during 2012, fluoride did not reach MW-2 and MW-3. These data confirm that the ASR injection water remains within the Llangollen well field."</p>
9	Section 3.1.1	Geology	first paragraph, pages 9-10	Slide 8 from Tetra Tech's memo is not included in Appendix D in the Work Plan. However, Figure 2.1 in Appendix C of the Work Plan depicts known/identified zero clay areas.	Slide 8 reference should include a reference to FS or SSCR, and a reference to Figure 2.1 will be included in future documents.
10	Section 3.3.1.2	Inert Area and Grantham South Area	first paragraph, page 12	U.S. Army Corps of Engineers constructed a cap over the Grantham South Area. The Inert Area cap was constructed between 1996 and 1997 by Settling Defendants under the 1995 Consent Decree.	As discussed with the USEPA on October 31, 2018, revisions to the CSM included in the PDI WP will not be made for the revised PDI WP but will be addressed for the PDI Evaluation Report. This decision pertains to the comments on Section 3 of the PDI WP. As such, this revision will be made for the PDI Evaluation Report.
11	Sections 3.3.3, 3.3.4 and 3.5.4.3	Area of Combined Mass - Manganese	pages 13-15, and 21-22	These sections refer to an "area of combined mass" "between wells MW-18 and MW-34 located south of Grantham South and wells BW-1 and MW-26N located in the northern portion of Llangollen Estates." As stated in the ROD-A2 Responsiveness Summary, the extent to which the Army Creek Landfill and DS&G Sites are contributing to elevated metals concentrations in specific areas of the Upper Potomac Aquifer, including elevated manganese concentrations between the Grantham South Area and monitoring wells BW-1 and MW-26N, has not been established and EPA has concerns about accuracy of the analysis of the "area of combined impacts" presented in Golder Associates' 2014 Memorandum on Preliminary Cleanup Goals. That analysis appears to be based on the unsubstantiated premise that elevated manganese concentrations between the eastern lobe of the Army Creek Landfill and monitoring well MW-26N are attributable solely to releases from the Army Creek Landfill Site, and not the waste management areas at the DS&G Site. An effort should be made to determine which source areas are contributing to increasing manganese concentrations at and downgradient of monitoring well MW-26N.	See response to comment 10. This revision will be made for the PDI Evaluation Report. The source areas for manganese to the well MW-26N area will be reviewed as part of the PDI activities.
12	Section 3.3.4	Source of UPA Impacts Observed in Well BW-2	second paragraph, pages 14-15	In the discussion regarding the source of 1,4-dioxane in the BW-2 area, concentrations in BW-2 are compared to concentrations in MW-28, 29, and 31. BW-2 is shown as being screened exclusively in the UPA lower sand while MW-28, 29, and 31 are shown as screened within both the UPA upper and lower sands. If MW-28, -29, and -31 were screened within one interval, then data collected from those wells would be more comparable to BW-2 and could provide more detailed information for this discussion. The noted differences in screened intervals should be recognized in the interpretation of historical data.	See response to comment 10. Revisions will be made for the PDI Evaluation Report.

Summary of USEPA's and DNREC's Comments on the Pre-Design Investigation and Remedial Design Work Plans and the DS&G Trust's Responses
Delaware Sand & Gravel Superfund Site, New Castle County, Delaware

Comment No.	Section No.	Category	Comment Location	Specific Comment	Response/Approach to Comment
13	Section 3.3.4	Source of UPA Impacts Observed in Well BW-2	second paragraph, page 14	Appendix 5.6 of SSCR, Rev. 2 does not include ground water elevation contours or flow directions as stated.	See response to comment 10. Revisions will be made for the PDI Evaluation Report.
14	Section 3.4.2	Discussion of Release Mechanisms	fourth paragraph, page 16	Migration of dissolved phase impacts due to advective transport from the DDA containment area through gaps in the UPCU (e.g. SS-2011-03) also occurred.	This migration formerly occurred. Currently there are inward and upward gradients due to operation of the LFE _x S. See response to comment 10. Revisions will be made for the PDI Evaluation Report.
15	Section 3.5.4.1.1	DDA	Section 3.5.4.1.1, third paragraph, page 20	It is noted here that COC-impacted groundwater exists outside the northern DDA slurry wall and the extent of this contamination is unknown. Since this groundwater is outside of the waste management area, additional investigation in this area is warranted.	As discussed with the USEPA on October 31, 2018 and discussed between the USEPA and DNREC on November 2, 2018, this investigation will be scoped and performed after completion of the current PDI scope, likely during Phase 4 of the PDI (see Section 6.2 of the PDI WP) or during the Remedial Design.
16	Section 3.5.4.2	UPCU Transition Zone	Section 3.5.4.2, first paragraph, bottom of page 20	It is noted here that contamination extends to the east and west of the DDA; the plume extent in these locations needs to be delineated.	<p>As discussed with the USEPA on October 31, 2018, groundwater contamination extends to the east of the DDA in the UPA upper sand as evidenced by data from well DDA-10-US. The UPCUTZ unit was not encountered at the DDA-10-US location; therefore, a UPCUTZ well was not installed in this area. Wells DDA-19-TZ and DDA-20-TZ are proposed downgradient southeast of the DDA and well DDA-10-US. Noting the lack of UPCUTZ at well DDA-10-US, these new UPCUTZ locations will address the extent of UPCUTZ impacts to the 'east' of the DDA. If the UPCUTZ is present and impacted at the DDA-19 and/or DDA-20 locations, then additional assessment may be proposed subsequent to the PDI (Phase 4 per the Final FS Rev 1).</p> <p>To the west of the DDA, groundwater contamination is monitored by UPA upper sand well DGC-2S. Data for well DGC-2S indicates that all VOCs and SVOCs are below the ss-PRGs in this well and only BCEE and 1,4-dioxane are above the RSLs. Arsenic, cobalt and manganese are above the ss-PRGs. Well DDA-18-TZ is proposed downgradient to the south. If the UPCUTZ is present and impacted at the DDA-18 location, then additional assessment may be proposed subsequent to the PDI (Phase 4 per the Final FS Rev 1).</p>
17	Section 3.5.4.3	Upper Potomac Aquifer	last paragraph, page 22	As stated in the last paragraph, there is uncertainty regarding the potential presence of groundwater impacts downgradient of the eastern portion of AWC's Llangollen well field. The remedial design should incorporate monitoring wells downgradient of the Llangollen well field.	As discussed with the USEPA on October 31, 2018, the following response to this comment was received from AWC via email: "I[t]he lack of fluoride not just in 2012, but in any year the ASR well was in operation, illustrates that the ground water capture on the eastern end of the Llangollen well field is maintained as long as withdrawal is maintained in Wells 2, 6 and 7 near allocated rates. The entire Llangollen well field was shut down in 2009. Only in the 2009-2010 ASR cycle was fluoride detected in MW-2 and MW-3. These data illustrate that MW-2 and MW-3 are properly located to monitor containment of ASR water in the well field. This occurrence demonstrates what the ground water flow models indicate, the Llangollen well field will maintain capture of the eastern end of the Delaware Sand and Gravel plume. In addition, the water levels in and around the Llangollen well field in the Potomac Aquifer are below sea level. The lowest water levels recorded are consistently within the Llangollen well field. Just the distribution of water levels indicates the Llangollen well field is the regional low point in the aquifer water levels. Regionally, water flow in the upper Potomac aquifer move towards the well field. The distribution of chloride concentration in the aquifer also illustrates the Llangollen well field maintains hydraulic control of the eastern side of the plume. MW-2 and (to a lesser extent) MW-3 both contain slightly elevated concentrations of chloride related to intrusion of Delaware River water. Therefore, the water quality at MW-2 and MW-3 indicate a source of water east of the well field, not a loss of water from the well field to the east or the presence of the Delaware Sand and Gravel plum[e]."
18	Section 3.5.5	Surface Water	Section 3.5.5, page 22	In order to properly evaluate groundwater flow gradients and groundwater/surface water interaction, water levels and contours for the Columbia should be provided. A strong vertical gradient downward does not preclude horizontal flow	See response to comment 10. As discussed with the USEPA on October 31, 2018, as part of the PDI Evaluation Report, contour maps will be prepared and provided along with water level data and vertical gradient calculations.
19	Section 3.6.2.3	UPCU Transition Zone from EW PW-1(U) to AWC Wellfield	Section 3.6.2.3, first paragraph, page 28	<p>The discussion here notes that contaminant migration may be facilitated by the coarser-grained layers within the UPCUTZ connecting with the UPA upper sand. This type of detail should be shown on the cross-sections.</p> <p>It is possible that the mounding observed in well P-6 is due to the recharge of these coarser-grained layers. The borehole logs should be revisited for lithologic descriptions of the material encountered in this area.</p>	<p>As discussed with the USEPA on October 31, 2018, additional lithologic details will be added to cross-sections and included as part of the PDI Evaluation Report.</p> <p>See also response to comment 10.</p>
20	Section 3.7	Evaluation of Risk	last paragraph, page 31	The discussion suggests that slab-ongrade constructions precludes the potential for exposure to Site-related contaminants due to vapor intrusion. All types of buildings, regardless of foundation type (e.g., basement, crawl space, slab-on-grade), have openings that render them potentially vulnerable to vapor intrusion as discussed in OSWER Publication 9200.2-154.	Screening of the small, 'office' building at bottom of Grantham Lane, southwestern edge of the Inert Area will be added to the SAP.
21	Section 3.7.3	Receptors and Potential Exposure Pathways	first bullet, page 33	EPA is not aware of any potential for industrial/commercial workers or residents to be exposed to Columbia Aquifer groundwater via ingestion or dermal contact with tap water. Are shallow (Columbia Aquifer) wells in use near the Site'	Shallow (Columbia Aquifer) wells are not in use near the Site. See response to comment 10. Revisions will be made for the PDI Evaluation Report.
22	Section 3.7.4	Risk Summary	last paragraph, page 34	EPA's 2015 Five-Year Review Report also identified the need for additional investigations to evaluate potential releases of contaminants of concern from the Inert Area and the Grantham South Area to groundwater	As discussed with the USEPA on October 31, 2018, this evaluation will be initially covered by PDI locations 102, 103, 104, 106, and 107 located around the landfill areas.
23	Section 3.8	Areas of Uncertainty	Section 3.8, pages 34-35	Since it has been noted extensively throughout the document that the UPCUTZ represents a key hydrostratigraphic unit in the area of the Sites and the characterization of this unit is one of the goals of the PDI, it is recommended that wells are constructed in the UPCUTZ (where it exists) at each well location.	<p>As discussed with the USEPA on October 31, 2018, six (DDA-19-TZ, UPA-102-TZ, UPA-103-TZ, UPA-104-TZ, UPA-105B-TZ, and UPA-106-TZ) of the seven contingency UPCUTZ wells and one additional UPCUTZ well (UPA-106-TZ) will be installed (provided the UPCUTZ exists in each of the well installation areas).</p> <p>SAP Tables A-3 and A-5 will be revised and included in revised SAP.</p>
		These two comments were originally in USEPA's October 5, 2018 email, but were not included in its October 24, 2018 comments. During our discussion on October 31, 2018, USEPA was unsure why they were not included in its October 24, 2018 comments.		Two UPA monitoring wells should be installed at each new monitoring location, even if the UPDC is determined to be absent.	SAP Tables A-3 and A-5 will be revised and included in revised SAP. As COCs have not been detected in the LS between the DDA and well PW-1(U), LS wells not required up near DDA. In response to this comment, one contingency LS well (UPA-103-LS) plus addition of LS well at UPA-101 (as discussed below) will be installed.
				An additional monitoring well is recommended in the lower sand at location UPA-101.	As discussed with the USEPA on October 31, 2018, due to space constraints in the area of the UPA-102 well cluster, installation of a contingent LS well at UPA-102 will be swapped for installation of a LS well near UPA-101/P-6. SAP Tables A-3 and A-5 will be revised and included in revised SAP.
24	4.2 and 5.1.4	Waste Management Area and Area of Attainment and Define the Boundaries of the Study	Section 4.2, second paragraph, page 36 and Section 5.1.4, page 42	As noted above, the impacted groundwater outside of the waste management area is subject to meeting ARARs and additional work to define the extent of contamination should be proposed.	As discussed with the USEPA on October 31, 2018, this investigation will be scoped and performed after completion of the current PDI scope.
25	Section 4.4	Selected Remedy	last bullet on page 37	The last bullet on page 37 should refer to Figures 6 and 7 rather than Figures 7 and 8.	This change will be made for the revised PDI WP.
26	Section 4.5	Compliance with ARARs	first paragraph, page 38	A discussion of selected ARARs is provided in this section of the Work Plan. Please state that additional ARARs are specified in Appendix D of ROD-A2	This change will be made for the revised PDI WP.
27	Section 5.1.2	Identify the Goals of the Study	list item 4, bottom of page 41	"Extent of contamination in the UPCUTZ to the east and west of the area of the DDA and well PW-1(U)" is identified as a data gap. The extent of contamination in the UPCUTZ has not been delineated. The assessment of the extent of contamination in the UPCUTZ should extend beyond the DDA/PW-1 area to assess impacts in the P-6 area and elsewhere, if necessary.	See response to USEPA PDI WP Comment 16. This change will be made for the revised PDI WP.
28	Section 6.2.1	Target Capture Zones and Extraction Rates	Location 105 bullet, page 46	Currently, no monitoring wells appear to be located outside of the plume east of UPA-01, and an additional goal of the location 105A/B wells is to delineate the eastern extent of the groundwater plumes. This is noted in Table 2 and should also be mentioned in the text.	This change will be made for the revised PDI WP.
29	Section 6.2.2	Migration between Hydrostratigraphic Units	Section 6.2.2, last paragraph, page 47	It is recommended that the last paragraph incorporates the creation of cross-sections with detailed lithologic information. The generic descriptions of UPA sand, for example, provided on the cross-sections included in this document are not sufficient for the analysis of transport pathways and understanding the interconnection between the UPCUTZ and the UPA upper sand and the source terms and the sands of the UPA.	The revised PDI WP will indicate that cross-sections with detailed lithologic information will be prepared for inclusion in the PDI Evaluation Report after completion of the PDI in the field.
30	Section 6.3.1	Advancement of Borings and Installation of Monitoring Wells	first paragraph, page 49	The Work Plan does not specify how long the grout should be allowed to cure and does not refer to an appropriate section of the SAP for a more thorough description of how these activities will be conducted. The documents should be reviewed and updated to ensure that direction is clearly provided for staff who will be conducting the field activities.	These changes will be made for the revised PDI WP.
31	Section 6.3.1	Advancement of Borings and Installation of Monitoring Wells	last paragraph, page 50	Soil samples are proposed to be collected from each of five locations in the UPA upper sand and UPCUTZ to support the design of the extraction well filter packs. Will the material encountered at the proposed locations be similar enough to that anticipated to be encountered in the P-6 area so that the filter pack for P-6-US-EXTR can be sized appropriately?	A soil sample will be collected during advancement of the boring at UPA-101-LS for use in design of the extraction well in the P-6 area. This addition will be made for the revised PD WP and SAP.

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Delaware Sand & Gravel Superfund Site, New Castle County, Delaware

Comment No.	Section No.	Category	Comment Location	Specific Comment	Response/Approach to Comment
32	Section 6.3.1	Advancement of Borings and Installation of Monitoring Wells	third paragraph (and fifth) page 50 and Table A-2 of SAP	The third paragraph discusses the use of VAP in the selection of screened intervals for monitoring wells. The paragraph states, "...the well screen intervals for the UPCUTZ, UPA upper sand and the UPA lower sand will each be based on the VAP samples from the profile location..." The fifth paragraph contains a similar description of how the screened interval for each well will be selected. Given the lithologic heterogeneity within individual units, as evidenced on many of the boring logs, and expected variations in hydraulic conductivity and the ability of the formation to move COC mass, lithology should be considered, in addition to VAP data, when choosing monitoring intervals and designing well screens. This comment also pertains to the SAP, e.g., Table A-2.	Lithology will be considered during the selection of the well screen intervals. This addition will be made for the revised PDI WP.
33	Section 6.3.3 and Appendix A	Groundwater Monitoring and Sampling and Analysis Plan	Section 6.3.3, page 51 and Appendix A	Low-flow purge and sampling is not appropriate for well screens longer than 10 feet. An alternate purging and sampling method should be proposed if a well does not meet this criterion.	As discussed with the USEPA on October 31, 2018, this topic is also under discussion and review for the adjacent ACL Site, and discussion for DS&G has been briefly deferred so that a consistent approach can be used at both sites that addresses EPA's concern while maintaining consistency with sampling conducted to date.
34	Section 7.2	Next Steps and Estimated Timeframes	Section 7.2, Table of Activities and Deliverables, page 58	The landfill gas migration assessment is scheduled to be performed 11/1/2018 – 2/1/2019. This activity should be scheduled before the ground is frozen.	Golder is in the process of scheduling/performing this activity, so it will be completed in early November 2018, ahead of the drilling activities associated with the PDI. A revised schedule will be included in the revised PDI WP.
35	Sampling and Analysis Plan, Section 4.2.1.2	Migration between Hydrostratigraphic Units	SAP Section 4.2.1.2, second paragraph, page 11	The second paragraph states, "As part of the PDI activities, the connection between the upper and lower sand units of the UPA between and downgradient of the Sites will be evaluated." Well couplets or triplets that are proposed to be installed are located either upgradient of P-6 or within approximately 400 feet downgradient of P-6. Review of background materials indicates that two additional well pairs (UPA-02 and DGC-10 locations) are located approximately 1,000 feet downgradient of P-6. This leaves an approximately 2,400-foot length of the mapped plume between the southernmost well pairs and the AWC production wells with no well pairs to evaluate the connection between the upper and lower sands. Additionally, there is very little quality lithologic information for the downgradient portion of the plume, especially along the western portion of the area of attainment, as most of these wells were installed using mud-rotary techniques. The rationale for not installing wells to monitor discrete zones in this area should be added to the Work Plan. The existing monitoring network may be acceptable for current operating conditions. However, it may not be sufficiently robust for performance monitoring of the remedial action and potential future operational changes.	As discussed with the USEPA on October 31, 2018, monitoring wells in addition to those proposed in the PDI WP will not be included in the revised PDI WP and/or SAP; however, if after performance of the PDI (well installation and monitoring, aquifer testing and groundwater modeling), it is determined that additional monitoring wells are needed, then locations will be proposed and an addendum to the revised PDI Work Plan and SAP will be prepared.
36	Sampling and Analysis Plan, Section 4.8	Analytical Methods	Section 4.8, fourth bullet, page 35	Modifications to EPA Method 537 are not recommended. The lab has provided information pertaining to its modified Method 537 to EPA. EPA is evaluating the lab's demonstration of capability/method detection limit study and performance testing and quality control data, and will provide comments when the review is completed.	In response to the USEPA's October 30, 2018 email requesting more information from Eurofins, Golder has requested and is awaiting the additional information from Eurofins. Eurofins has indicated that the information will be provided to Golder by November 21, 2018. This information will be provided to the USEPA for its review as soon as it is received by Golder. As discussed with the USEPA on October 31, 2018, the USEPA's review of Eurofins method modifications will not necessarily preclude use of the method. The USEPA intends to collect split samples during the April 2019 groundwater monitoring event for analysis by another lab using unmodified method 537 and/or analysis by USEPA Region 5 by direct injection.
37	Section 4.8 of the SAP	Standard Methods	Section 4.8, page 36 and Table A-15	Section 4.8 of the SAP notes the use of 21st Edition of Standard Methods. Table A-15 notes ferrous iron will be analyzed by SM 3500 FE D. SM 3500 FE D does not exist in the 21st Edition of Standard Methods. The provided laboratory document notes that the 18th Edition of Standard Methods will be followed. Another difference is that the laboratory uses the 22nd Edition of Standard Methods for other analyses such as sulfide, anions, and alkalinity. Please clarify methods and editions of standard methods to be used.	These changes will be made for the revised SAP.
38	Sampling and Analysis Plan, Figures A-4	Figure	Figure A-4	Proposed UPA-01-US-EXTR and proposed DDA-10/12-US-EXTR are mislabeled.	This change will be made for the revised SAP.
39	Sampling and Analysis Plan, Figures A-3, A-6B, A-6C, A-6D, and A-6E	Figures	Figures A-3, A-6B, A-6C, A-6D, and A-6E	On the figures, wells at locations DDA-18, 19, and 20 are shown in the legend as extraction wells while on Figure A-3 they are shown as monitoring wells. The wells should be correctly identified.	These changes will be made for the revised SAP.
40	Sampling and Analysis Plan, Table A-6C	Table	Table A-6C	Please update the last two columns on the third page of the table to reflect revisions to the ACL Additional Investigation Work Plan based on ACL stakeholder comments and discussions.	These changes will be made for the revised SAP.
41	Sampling and Analysis Plan, Table A-14	Table	Table A-14	Two analytes, arsenic and BCCE, have lab provided method detection limits that are higher than preliminary remediation goals noted in Work Plan Table 1. The provided analytical SOP (ED-MSS-09) for BCCE does indicate a selective ion monitoring procedure for achieving a quantitation limit lower than the preliminary remediation goal. Please include in Table A-14 quantitation limits and method detection limits for BCCE low level analysis. Please address arsenic.	These changes will be made for the revised SAP.
42	Sampling and Analysis Plan, Table A-15	Table	Table A-15	The transportation device (cooler) needs to contain at least one temperature blank to verify proper temperature during shipment. Please include the frequency of temperature blanks in Table A-15 as one per cooler.	These changes will be made for the revised SAP.
USEPA Comments on Remedial Design Work Plan Received via email dated October 24, 2018					
General Comments					
1	Composite Barrier Cap	Groundwater Hydraulics and Cap Design	Section 4.2.3, page 20	The RD Work Plan discusses the installation of extraction wells in the DDA area, both within the slurry wall (ELFExS) and directly south of the containment barrier, north of PW- (DDA-10/12-US-EXTR, DDA-05-TZ-EXTR and DDA-06-TZ-EXTR). Section 4.2.3 describes the installation of the additional LFExS wells within the slurry wall and the associated hydraulic testing that will take place prior to construction of the composite barrier cap, which is an acceptable sequence. Because the proposed composite cap is expected to reduce recharge/infiltration into the subsurface, groundwater hydraulics after the cap is installed may be different from groundwater hydraulics prior to cap installation. Therefore, the effects of the cap on groundwater hydraulics should be incorporated into the design. The RD Work Plan should state that the effects of the cap will be included in the design.	These changes will be made for the revised SAP. As discussed with the USEPA on October 31, 2018, the revised RDWP will be submitted in 2019 after submittal of the revised PDI WP and SAP.
2	NA	Footnotes	misc.	There is redundant numbering for some footnotes, e.g., "Existing slurry-wall system;24[7]" in Section 3.2.1.	Footnote numbers from quotes will be stricken and only one set of footnote numbers will be included in the revised documents
Specific Comments					
3	Section 2.3	Conceptual Site Model and Areas of Uncertainty	Section 2.3, pages 4-5	It is noted here that the extent of impacted soil and groundwater in the Columbia Aquifer along the northern DDA slurry wall is an uncertainty. The last sentence of this section states that the activities proposed to address these areas of uncertainty are presented in the PDI WP Summary sections which follow. However, planned activities to evaluate the extent of contamination outside of the DDA is not addressed in Section, 2.4 PDI WP Summary. The issue was identified in comments provided by both DNREC and EPA on the PDI WP. The relevant sections in this Work Plan should be revised to address those comments.	See response to USEPA PDI WP Comment 15 above.
4	Section 3.1.2.2.2	LFG Mitigation System	Section 3.1.2.2.2, page 12	Please update status of direct venting system.	This change will be made for the revised RDWP.
5	Section 4.1.1 and Section 4.2.4	AoA Extraction Well Installation and WMA Extraction Wells Installation	pages 17 and 18, and pages 20 and 21	Section 4 of the Work Plan discusses remedial design components, objectives and performance standards. Please specify in Sections 4.1.1 and 4.2.4 of the Work Plan that "[t]he effectiveness of the groundwater extraction system in capturing and containing contaminant mass will be routinely evaluated and the system will be modified as necessary to achieve the RAO for groundwater in the Upper Potomac Aquifer," as stated in the description of the Selected Remedy in ROD-A2.	This change will be made for the revised RDWP.
6	Section 4.2.1	Slurry-wall System	Section 4.2.1, page 19	Performance standards for the slurry wall are given in the 1993 ROD Amendment. Please include this information in the Work Plan	This change will be made for the revised RDWP.
7	Section 5.1	Preliminary (30%) RD	Section 5.1, page 26-27	The Preliminary RD deliverable for RD-2 should include anticipated conveyance piping route and connection location for UPCUTZ extraction wells.	This change will be made for the revised RDWP.